

Distribution Patterns and Behaviors of Humpback Whales around Oahu, Kauai, Hawaii and Kahoolawe: 2002-2005

Island	Kauai	Site Elevation	120 ft
--------	-------	----------------	--------

Site	Lumahai Lookout	Site #	1
------	-----------------	--------	---

Whale Spotting Probability	MED/HI	2.00
----------------------------	--------	------

Surface Activity Index	MED/HI	0.95
------------------------	--------	------

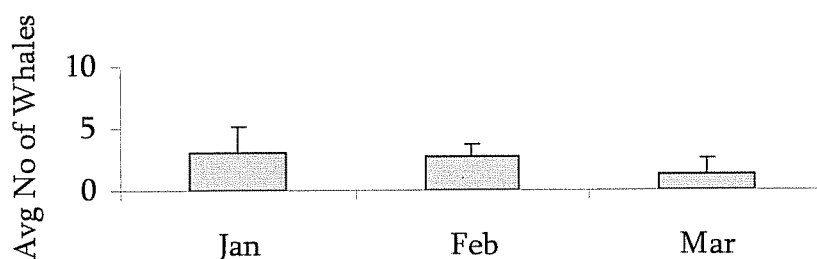


Figure 32 and Table 52. Average number of whales (+Standard Deviation in graph) counted at Lumahai Lookout during nine 15-minute periods between 08:00 am and 12:15 pm between January and March 2002-2005.

Year	Month		
	Jan	Feb	Mar
2002	1	3	1
2003	3	2	0
2004	2	2	3
2005	6	4	1

Table 53. Average number of breaches and body slaps (used as an index of whale surface activity) per whale at Lumahai Lookout over the sampling period.

	Jan		Feb		Mar	
	Breach	Slap	Breach	Slap	Breach	Slap
2002	<i>2.10</i>	<i>0.10</i>	<i>0.99</i>	<i>0.65</i>	<i>0.33</i>	<i>1.00</i>
2003	-	-	<i>3.46</i>	<i>0.92</i>	-	-
2004	<i>0.11</i>	<i>0.19</i>	<i>0.13</i>	<i>0.10</i>	<i>0.45</i>	<i>0.79</i>
2005	<i>0.76</i>	<i>2.77</i>	<i>2.09</i>	<i>1.10</i>	<i>0.25</i>	<i>0.56</i>
Avg	<i>1.19</i>	<i>1.02</i>	<i>1.67</i>	<i>0.69</i>	<i>0.34</i>	<i>0.78</i>

Distribution Patterns and Behaviors of Humpback Whales around Oahu, Kauai, Hawaii and Kahoolawe: 2002-2005

Island **Kauai** Site Elevation **120 ft**
 Site **Princeville Hotel** Site # **2**

Whale Spotting Probability **MED/HI 3.00**

Surface Activity Index **MED/HI 0.80**

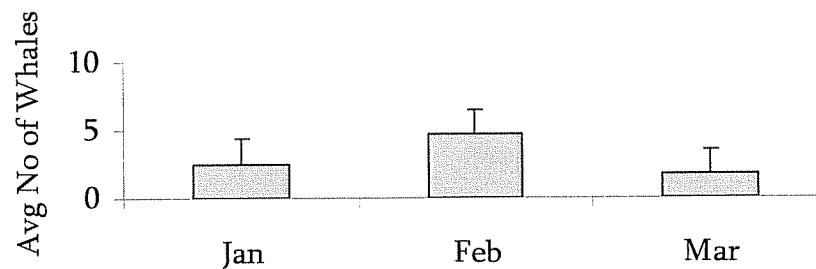


Figure 33 and Table 54. Average number of whales (+Standard Deviation in graph) counted at Princeville Hotel during nine 15-minute periods between 08:00 am and 12:15 pm between January and March 2002-2005.

Year	Month		
	Jan	Feb	Mar
2002	3	7	1
2003	1	5	0
2004	5	3	4
2005	1	4	2

Table 55. Average number of breaches and body slaps (used as an index of whale surface activity) per whale at Princeville Hotel over the sampling period.

	Jan		Feb		Mar	
	Breach	Slap	Breach	Slap	Breach	Slap
2002	0.75	2.08	0.44	1.15	0.46	0.35
2003	0.13	0.25	1.15	0.43	0.20	0.30
2004	0.63	0.83	0.16	0.52	0.44	1.21
2005	0.63	4.07	0.54	0.53	0.64	0.00
Avg	0.56	1.81	0.57	0.68	0.44	0.72

Distribution Patterns and Behaviors of Humpback Whales around Oahu, Kauai, Hawaii and Kahoolawe: 2002-2005

Island	Kauai	Site Elevation	180 ft
Site	Kilauea Point National Wildlife Refuge	Site #	3

Whale Spotting Probability	HIGH	5.08
----------------------------	------	------

Surface Activity Index	MED/L	0.42
------------------------	-------	------

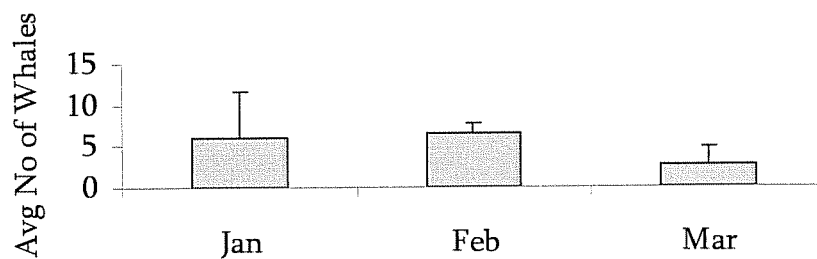


Figure 34 and Table 56. Average number of whales (+Standard Deviation in graph) counted at Kilauea Point National Wildlife Refuge during nine 15-minute periods between 08:00 am and 12:15 pm between January and March 2002-2005.

Year	Month		
	Jan	Feb	Mar
2002	4	8	5
2003	1	6	1
2004	5	5	4
2005	14	7	1

Table 57. Average number of breaches and body slaps (used as an index of whale surface activity) per whale at Kilauea Point National Wildlife Refuge over the sampling period.

	Jan		Feb		Mar	
	Breach	Slap	Breach	Slap	Breach	Slap
2002	0.63	0.39	0.16	0.21	0.02	2.31
2003	0.00	0.75	0.19	0.27	0.17	0.25
2004	0.30	0.30	0.05	0.33	0.13	0.77
2005	0.43	0.30	0.19	0.15	0.00	0.17
Avg	0.48	0.69	0.15	0.24	0.08	0.87

Distribution Patterns and Behaviors of Humpback Whales around Oahu, Kauai, Hawaii and Kahoolawe: 2002-2005

Island Kauai

Site Elevation

250 ft

Site Kilauea Point NWR Crater Hill

Site # 4

Whale Spotting Probability

MED/HI 3.00

Surface Activity Index

MED/L 0.46

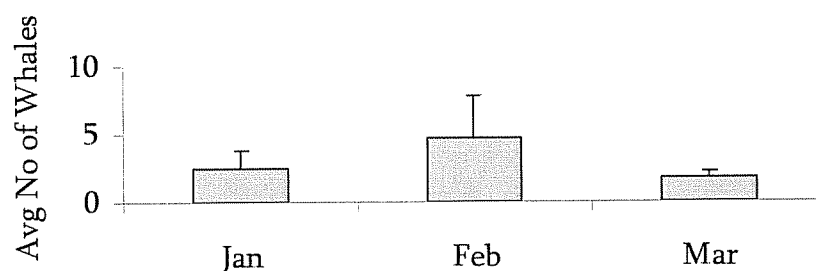


Figure 35 and Table 58. Average number of whales (+Standard Deviation in graph) counted at Kilauea Point NWR—Crater Hill during nine 15-minute periods between 08:00 am and 12:15 pm between January and March 2002-2005.

Year	Month		
	Jan	Feb	Mar
2002	2	9	2
2003	1	4	2
2004	3	4	2
2005	4	2	1

Table 59. Average number of breaches and body slaps (used as an index of whale surface activity) per whale at Kilauea Point NWR—Crater Hill over the sampling period.

	Jan		Feb		Mar	
	Breach	Slap	Breach	Slap	Breach	Slap
2002	0.20	0.25	0.13	0.13	0.13	0.00
2003	0.54	0.33	0.11	0.26	0.25	2.05
2004	0.00	1.50	0.00	0.00	-	-
2005	0.00	1.30	0.00	1.51	0.00	0.38
Avg	0.19	0.86	0.06	0.68	0.13	0.81

Distribution Patterns and Behaviors of Humpback Whales around Oahu, Kauai, Hawaii and Kahoolawe: 2002-2005

Island Kauai

Site Elevation

40 ft

Site Kapaa Lookout

Site # 5

Whale Spotting Probability

HIGH 3.83

Surface Activity Index

MED/HI 0.68

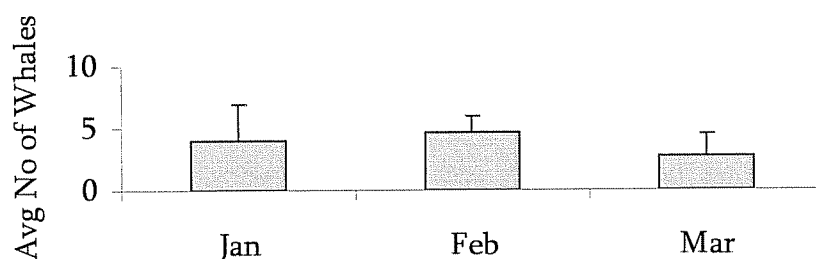


Figure 36 and Table 60. Average number of whales (+Standard Deviation in graph) counted at Kapaa Lookout during nine 15-minute periods between 08:00 am and 12:15 pm between January and March 2002-2005.

Year	Month		
	Jan	Feb	Mar
2002	0	5	3
2003	5	6	1
2004	4	5	5
2005	7	3	2

Table 61. Average number of breaches and body slaps (used as an index of whale surface activity) per whale at Kapaa Lookout over the sampling period.

	Jan		Feb		Mar	
	Breach	Slap	Breach	Slap	Breach	Slap
2002	0.60	0.10	0.07	0.19	0.17	0.57
2003	0.07	0.40	0.35	0.82	0.14	0.79
2004	0.13	1.15	0.03	0.06	0.29	0.27
2005	0.05	0.73	0.45	0.03	2.95	5.55
Avg	0.23	0.60	0.24	0.29	0.89	1.80

Distribution Patterns and Behaviors of Humpback Whales around Oahu, Kauai, Hawaii and Kahoolawe: 2002-2005

Island **Kauai** 0 ft

Site **Ahukini State Recreation Pier** Site # **6**

Whale Spotting Probability **HIGH** **3.50**

Surface Activity Index **MED/HI** **0.67**

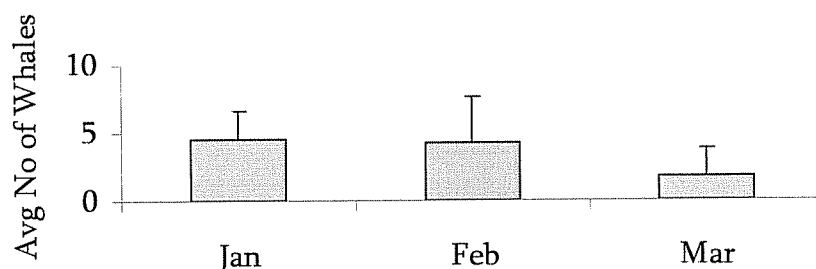


Figure 37 and Table 62. Average number of whales (+Standard Deviation in graph) counted at Ahukini State Recreation Pier during nine 15-minute periods between 08:00 am and 12:15 pm between January and March 2002-2005.

Year	Month		
	Jan	Feb	Mar
2002	7	7	3
2003	5	7	4
2004	2	3	0
2005	4	0	0

Table 63. Average number of breaches and body slaps (used as an index of whale surface activity) per whale at Ahukini State Recreation Pier over the sampling period.

	Jan		Feb		Mar	
	Breach	Slap	Breach	Slap	Breach	Slap
2002	-	-	0.54	0.57	0.17	0.57
2003	0.20	0.40	0.13	0.04	0.04	1.96
2004	0.30	0.20	0.17	0.17	3.00	0.00
2005	0.45	0.60	-	-	1.17	1.00
Avg	0.48	0.40	0.28	0.26	1.10	0.88

Distribution Patterns and Behaviors of Humpback Whales around Oahu, Kauai, Hawaii and Kahoolawe: 2002-2005

Island **Kauai** Site Elevation **10 ft**
 Site **Ninini Lighthouse** Site # **7**

Whale Spotting Probability **HIGH 4.17**
 Surface Activity Index **MED/L 0.46**

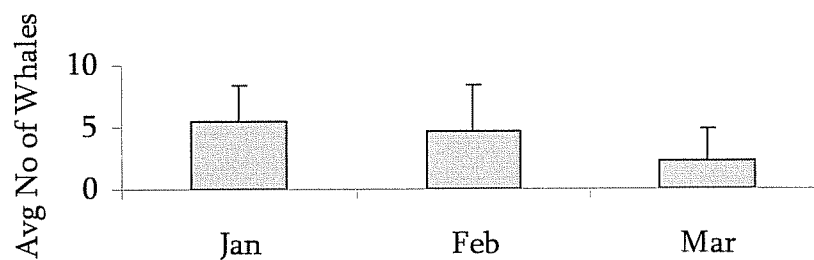


Figure 38 and Table 64. Average number of whales (+Standard Deviation in graph) counted at Ninini Lighthouse during nine 15-minute periods between 08:00 am and 12:15 pm between January and March 2002-2005.

Year	Month		
	Jan	Feb	Mar
2002	3	5	4
2003	8	5	5
2004	3	9	0
2005	8	0	0

Table 65. Average number of breaches and body slaps (used as an index of whale surface activity) per whale at Ninini Lighthouse over the sampling period.

	Jan		Feb		Mar	
	Breach	Slap	Breach	Slap	Breach	Slap
2002	0.26	0.21	0.09	0.68	0.00	0.16
2003	0.00	0.07	0.37	1.42	0.06	2.50
2004	0.30	0.30	0.05	0.07	0.00	0.50
2005	0.00	0.43	0.50	1.00	0.00	1.00
Avg	0.27	0.39	0.25	0.79	0.02	1.04

Distribution Patterns and Behaviors of Humpback Whales around Oahu, Kauai, Hawaii and Kahoolawe: 2002-2005

Island **Kauai** Site Elevation **25 ft**
 Site **Mahaulepu Haula** Site # **8**

Whale Spotting Probability **HIGH 7.33**
 Surface Activity Index **MED/HI 0.40**

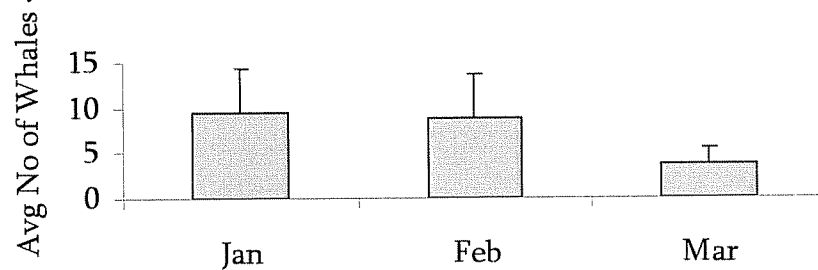


Figure 39 and Table 66. Average number of whales (+Standard Deviation in graph) counted at Mahaulepu Haula during nine 15-minute periods between 08:00 am and 12:15 pm between January and March 2002-2005.

Year	Month		
	Jan	Feb	Mar
2002	4	7	6
2003	7	6	2
2004	14	16	3
2005	13	6	4

Table 67. Average number of breaches and body slaps (used as an index of whale surface activity) per whale at Mahaulepu Haula over the sampling period.

	Jan		Feb		Mar	
	Breach	Slap	Breach	Slap	Breach	Slap
2002	0.71	0.20	0.13	0.19	0.02	0.55
2003	-	-	-	-	-	-
2004	0.27	0.72	0.09	0.86	0.24	1.14
2005	0.04	0.87	0.16	0.48	0.29	0.27
Avg	0.34	0.60	0.13	0.51	0.18	0.65

Distribution Patterns and Behaviors of Humpback Whales around Oahu, Kauai, Hawaii and Kahoolawe: 2002-2005

Island Kauai

Site Elevation

40 ft

Site Mahaulepu Makawehi Site # 9

Whale Spotting Probability

HIGH 4.67

Surface Activity Index

MED/HI 0.59

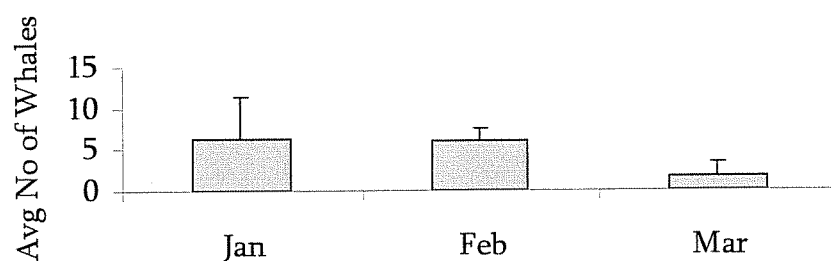


Figure 40 and Table 68. Average number of whales (+Standard Deviation in graph) counted at Mahaulepu Makawehi during nine 15-minute periods between 08:00 am and 12:15 pm between January and March 2002-2005.

Year	Month		
	Jan	Feb	Mar
2002	1	7	4
2003	11	9	1
2004	6	6	1
2005	7	2	1

Table 69. Average number of breaches and body slaps (used as an index of whale surface activity) per whale at Mahaulepu Makawehi over the sampling period.

	Jan		Feb		Mar	
	Breach	Slap	Breach	Slap	Breach	Slap
2002	0.50	0.02	0.13	0.02	0.66	4.45
2003	0.00	0.00	0.59	0.62	0.00	0.00
2004	0.60	2.34	0.17	0.43	-	-
2005	0.04	0.62	0.03	0.58	0.33	0.20
Avg	0.29	0.75	0.23	0.41	0.33	1.55

Distribution Patterns and Behaviors of Humpback Whales around Oahu, Kauai, Hawaii and Kahoolawe: 2002-2005

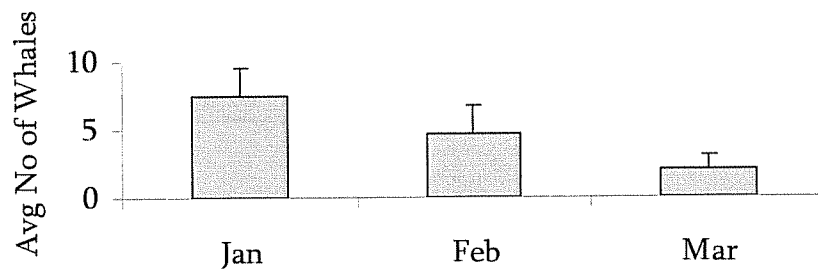
Island **Kauai** Site Elevation **30 ft**Site **Makahuena Point** Site # **10**Whale Spotting Probability **HIGH** **4.75**Surface Activity Index **MED/HI** **0.56**

Figure 41 and Table 70. Average number of whales (+Standard Deviation in graph) counted at Makahuena Point during nine 15-minute periods between 08:00 am and 12:15 pm between January and March 2002-2005.

Year	Month		
	Jan	Feb	Mar
2002	8	7	3
2003	10	6	1
2004	5	3	3
2005	7	3	1

Table 71. Average number of breaches and body slaps (used as an index of whale surface activity) per whale at Makahuena Point over the sampling period.

	Jan		Feb		Mar	
	Breach	Slap	Breach	Slap	Breach	Slap
2002	0.59	0.41	0.15	0.08	0.64	1.09
2003	0.08	1.27	0.22	0.22	-	-
2004	0.62	1.02	0.30	0.71	0.00	0.94
2005	0.00	0.15	0.09	2.20	1.10	0.30
Avg	0.32	0.71	0.19	0.8	0.58	0.78

Distribution Patterns and Behaviors of Humpback Whales around Oahu, Kauai, Hawaii and Kahoolawe: 2002-2005

Island **Kauai** Site Elevation **0-10 ft**
 Site **Poipu Beach Park** Site # **11**
 Whale Spotting Probability **MED/HI 2.67**
 Surface Activity Index **MED/HI 0.94**

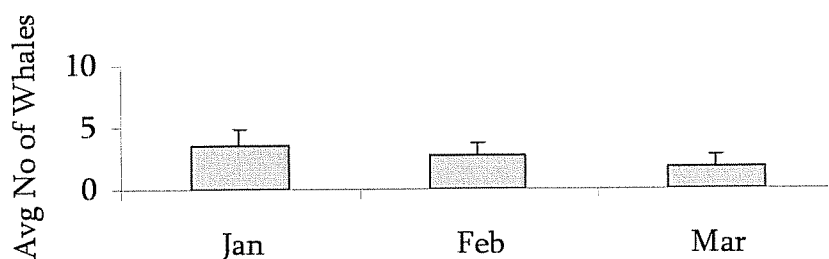


Figure 42 and Table 72. Average number of whales (+Standard Deviation in graph) counted at Poipu Beach Park during nine 15-minute periods between 08:00 am and 12:15 pm between January and March 2002-2005.

Year	Month		
	Jan	Feb	Mar
2002	2	4	2
2003	3	2	1
2004	5	3	3
2005	4	2	1

Table 73. Average number of breaches and body slaps (used as an index of whale surface activity) per whale at Poipu Beach Park over the sampling period.

	Jan		Feb		Mar	
	Breach	Slap	Breach	Slap	Breach	Slap
2002	0.45	0.88	0.05	0.05	0.64	1.09
2003	0.12	0.61	0.13	0.73	0.00	0.57
2004	0.30	0.35	0.00	0.13	-	-
2005	0.00	0.37	0.15	10.35	3.50	0.13
Avg	0.22	0.55	0.08	2.82	1.38	0.6

Distribution Patterns and Behaviors of Humpback Whales around Oahu, Kauai, Hawaii and Kahoolawe: 2002-2005

Island Kauai

Site Elevation

40-50 ft

Site Kaiwa Point

Site # 12

Whale Spotting Probability

HIGH 4.17

Surface Activity Index

LOW 0.35

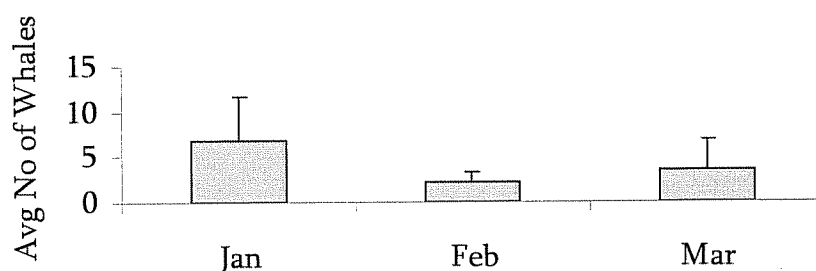


Figure 43 and Table 74. Average number of whales (+Standard Deviation in graph) counted at Kaiwa Point during nine 15-minute periods between 08:00 am and 12:15 pm between January and March 2002-2005.

Year	Month		
	Jan	Feb	Mar
2002	5	3	4
2003	14	1	8
2004	5	2	1
2005	3	3	1

Table 75. Average number of breaches and body slaps (used as an index of whale surface activity) per whale at Kaiwa Point over the sampling period.

	Jan		Feb		Mar	
	Breach	Slap	Breach	Slap	Breach	Slap
2002	<i>0.13</i>	<i>0.36</i>	<i>0.06</i>	<i>0.03</i>	<i>0.03</i>	<i>0.23</i>
2003	<i>0.05</i>	<i>1.38</i>	<i>0.00</i>	<i>0.00</i>	-	-
2004	<i>0.54</i>	<i>1.26</i>	<i>0.44</i>	<i>0.21</i>	<i>0.31</i>	<i>1.00</i>
2005	<i>0.06</i>	<i>0.09</i>	<i>0.19</i>	<i>0.90</i>	<i>0.38</i>	<i>0.00</i>
Avg	0.20	0.77	0.17	0.29	0.24	0.41

Distribution Patterns and Behaviors of Humpback Whales around Oahu, Kauai, Hawaii and Kahoolawe: 2002-2005

Island	Kauai	Site Elevation	30 ft
Site	Port Allen Cemetery	Site #	13
Whale Spotting Probability	MED/HI	2.89	
Surface Activity Index	LOW	0.29	

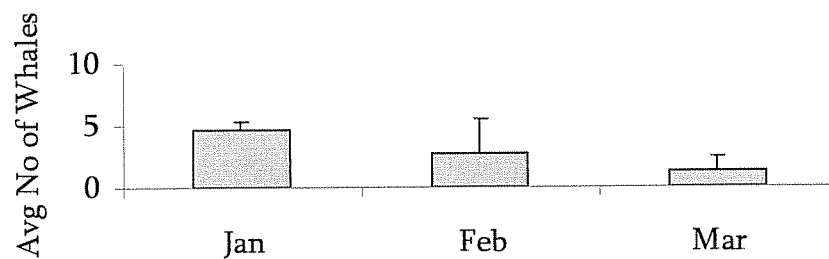


Figure 44 and Table 76. Average number of whales (+Standard Deviation in graph) counted at Port Allen Cemetery during nine 15-minute periods between 08:00 am and 12:15 pm between January and March 2002-2005.

Year	Month		
	Jan	Feb	Mar
2002	-	-	-
2003	5	6	2
2004	4	1	0
2005	5	1	2

Table 77. Average number of breaches and body slaps (used as an index of whale surface activity) per whale at Port Allen Cemetery over the sampling period.

	Jan		Feb		Mar	
	Breach	Slap	Breach	Slap	Breach	Slap
2002	0.13	0.36	0.06	0.03	0.03	0.23
2003	0.21	1.24	-	-	0	0.97
2004	0.23	0.47	0	0.09	-	-
2005	0	0.22	0.44	0.88	0	0.26
Avg	0.14	0.57	0.17	0.33	0.01	0.49

200 ft

LOW 0.16

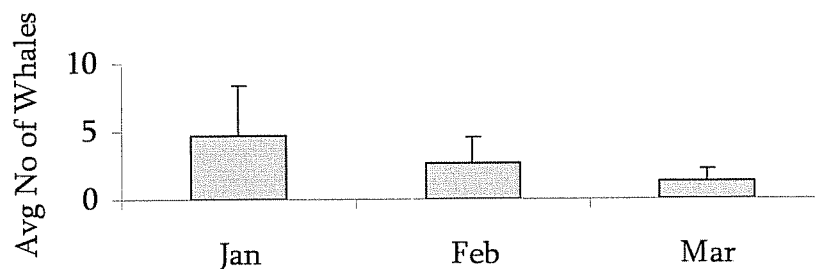


Figure 45 and Table 78. Average number of whales (+Standard Deviation in graph) counted at Waimea Canyon Drive during nine 15-minute periods between 08:00 am and 12:15 pm between January and March 2002-2005.

Year	Month		
	Jan	Feb	Mar
2002	-	5	2
2003	0	3	1
2004	6	1	2
2005	7	1	3

Table 79. Average number of breaches and body slaps (used as an index of whale surface activity) per whale at Waimea Canyon Drive over the sampling period.

	Jan		Feb		Mar	
	Breach	Slap	Breach	Slap	Breach	Slap
2002	-	-	-	-	-	-
2003	<i>0</i>	<i>0.5</i>	-	-	-	-
2004	<i>0</i>	<i>1.41</i>	<i>0</i>	<i>0.13</i>	<i>0</i>	<i>0</i>
2005	<i>0.08</i>	<i>0.16</i>	<i>0.33</i>	<i>0</i>	-	-
Avg	<i>0.03</i>	<i>0.69</i>	<i>0.17</i>	<i>0.07</i>	<i>0</i>	<i>0</i>

Distribution Patterns and Behaviors of Humpback Whales around Oahu, Kauai, Hawaii and Kahoolawe: 2002-2005

Island	Kauai	Site Elevation	15 ft
Site	Pacific Missile Range Facility	Site #	15

Whale Spotting Probability	MED/HI	1.50
----------------------------	--------	------

Surface Activity Index	LOW	0.66
------------------------	-----	------

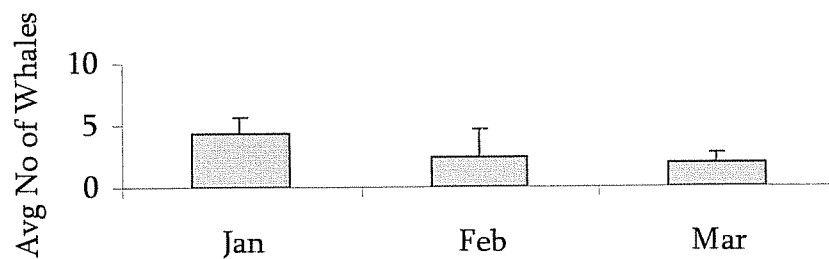


Figure 46 and Table 80. Average number of whales (+Standard Deviation in graph) counted at Pacific Missile Range Facility during nine 15-minute periods between 08:00 am and 12:15 pm between January and March 2002-2005.

Year	Month		
	Jan	Feb	Mar
2002	2	-	-
2003	1	-	-
2004	3	3	0
2005	4	0	1

Table 81. Average number of breaches and body slaps (used as an index of whale surface activity) per whale at Pacific Missile Range Facility over the sampling period.

	Jan		Feb		Mar	
	Breach	Slap	Breach	Slap	Breach	Slap
2002	-	-	-	-	-	-
2003	-	-	-	-	-	-
2004	<i>0.22</i>	<i>1.08</i>	-	-	<i>0.19</i>	<i>0.71</i>
2005	<i>1.4</i>	<i>1.98</i>	<i>0.34</i>	<i>0</i>	<i>0.71</i>	<i>0.98</i>
Avg	<i>0.81</i>	<i>1.53</i>	<i>0.34</i>	<i>0</i>	<i>0.45</i>	<i>0.84</i>